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English Language Literacy Development in Deaf Individuals: The Role of Environmental Factors

Brooke Harding & Mark W. Tanner

Abstract

Learning to read and write plays a significant role in children's linguistic and cognitive development. However, prelingually deaf children born into hearing families face immense linguistic, social, and emotional obstacles in the acquisition of reading and writing skills (Swisher, 1989). This research was carried out to gain firsthand information on the nature of literacy acquisition by deaf individuals. A case study approach was employed in order to investigate factors contributing to two prelingually deaf adults' acquisition of literacy in English. Findings from this study showed the significance of the home and school settings as learning environments which either enhanced or hindered the development of reading and writing skills. Suggestions based these findings are discussed for caregivers and educators of deaf students.

Introduction

Learning to read and write plays a significant role in children's linguistic and cognitive development.¹ Cortney & Daisey (1992) state that literacy skills help children develop cognitively by introducing children to the vast well of knowledge contained in books, magazines, newspapers, and libraries. Schirmer (1994) explains that exposure to and experimentation with language in the written form enhances children's metalinguistic knowledge because print presents language in a visual and systematic manner. Raimes (1983), a noted second language writing research and materials developer, indicates that writing reinforces children's unconscious, but implicit knowledge of grammar, idioms, and vocabulary and gives them the opportunity to be creative with their language and take risks (p. 3).

Learning to read, therefore, becomes an integral part of the linguistic development of typical hearing children in their formative years as they grasp the connection between oral language and print. Dickinson & McCabe (1991) note that the development of reading skills is a natural process in a home where literacy is emphasized and children are surrounded by print. However, the acquisition of literacy is not an easy task for all children because it requires the complex coordination of various capabilities (Ely, 1997). In particular, deaf children face major difficulties in the acquisition of reading and writing skills. (The term *deaf* is used in this paper to denote both deaf and hard-of-hearing individuals. The term *Deaf* is used to refer to the cultural group whose primary means of communication is American Sign Language). According to standardized reading assessments, most deaf high school graduates read at roughly a third or fourth grade level (Allen, 1986; King & Quigley, 1985; as cited in Holcomb and Peyton, 1992, p. 1). Ratner (1997) explains that deaf children frequently have problems understanding the function and application of modals, verb auxiliaries, infinitives, and gerunds (p. 352). Several researchers have reported that deaf students have limited vocabulary skills in comparison to their normal-hearing peers (see discussion in Ratner,

1997). In writing, deaf people commonly make functional errors such as omitting or confusing grammatical morphemes and have difficulty in controlling complex structures such as complements and relative clauses (Swisher, 1989, p. 240). Many instructional approaches have been developed to address such problems. However, even with these approaches, literacy levels among the deaf population have not significantly increased (Limbrick, 1991, p. 5).

As a result of inadequate reading and writing skills, deaf adults face tremendous challenges in obtaining employment, functioning within the workplace, and receiving higher-level jobs (Holcomb & Peyton, 1992, p. 1). Many deaf adults with underdeveloped literacy skills are able to manage in everyday life by learning to reorganize common words and relying more on non-linguistic information in their environments. Nonetheless, limited reading and writing capabilities severely restrict deaf people in communicating with and participating in the hearing world around them (Cornett & Daisey, 1992).

In order to better understand the nature of literacy acquisition by individuals who are deaf, we will review previous research that discusses the relationship between oral language and literacy development, the mandatory conditions for healthy language acquisition, and the typical difficulties faced by deaf people in acquiring English literacy skills.

Review of literature

The Relationship between the Acquisition of Oral Language and Literacy Skills. Gleason (1997) states that the "mastery of reading and writing are inextricably linked to knowledge of the oral language system" (p. 352). Despite the definite differences in grammar and sentence structure that exist between spoken and written language, fluency in the oral form of language facilitates understanding and competency in the printed form. Proficiency in oral language equips children with a complex knowledge of syntax, an extensive vocabulary, and an understanding of pragmatics and language as a communicative means (Gleason, 1997, p. 20). Linguistic competence thus provides children with a basis to develop bottom-up decoding and lexical skills. Fluency in an oral L1 also allows children to explore linguistically the attributes of their environments and gain the experiential and background knowledge that are essential for fluent reading (Lane, Hoffmeister, & Bahan, 1996, p. 280).²

Oral Language Development. Oral language development is a natural phenomenon in most normal-hearing children. With few exceptions, normal-hearing children throughout the world acquire the major components of their native language by the time they are three or four years old, regardless of the complexity of the grammatical and phonological system (Gleason, 1997, p. 1). However, children cannot acquire language independently or in isolation (Sacks, 1990). Gleason (1997) states that the "biological capacity to learn language will not be realized without certain kinds of environmental support" (p. 50). Certain conditions and stimuli must exist in a child's immediate environment in order for language to naturally emerge. These imperative conditions include sufficient

availability of comprehensible linguistic input and ample social interaction with fluent speakers of the target language (Dickinson & McCabe, 1991; Gleason, 1997; Swisher, 1989, p. 241). Constant and abundant exposure to authentic language also provides children with a pool of morphological, syntactic, and semantic information to analyze, sort, organize and integrally produce. Within the first few years of life, children gradually master the nuances and irregularities of grammar, acquire a complex understanding of various syntactic structures, and obtain an extensive vocabulary.

Deaf Children and Oral Language Development. Deaf children's oral language development is complicated by linguistic and social constraints, which consequently impact their literacy development. Swisher (1989) describes the language learning obstacles that prelingually deaf children face when born into normal-hearing families. Language development for these children is initially restricted by insufficient auditory access to the language of the environment, despite the abundance of oral language input (p. 241-242). The inability to sufficiently perceive acoustic stimuli leads to a drastic reduction in both the quantity and quality of linguistic information that children can interpret (Swisher, 1989, p. 241). The product of auditory sensory reception is fragmentary and depending on the nature of the hearing loss, distorted and inconsistent (p. 242; Webster, 1986). Researchers Oller and Eilers (1988) indicate that healthy phonological development requires the ability to hear normally. Through the auditory channel, children perceive and in turn produce the speech sounds and patterns typical of their linguistic environment (cited in Dickinson & McCabe, 1991). Insufficient audition not only limits the production of speech sounds, but it also limits the body of morphological, syntactic, and semantic information that deaf children can analyze and realize in their own utterances. As a result, a complete knowledge of syntax and grammar does not naturally develop, nor can deaf children amass an extensive vocabulary by merely overhearing as normal-hearing children frequently do (Gleason, 1997, p. 352).

It is interesting to note that the majority of prelingually deaf children are born into normal-hearing families. This situation indicates that hearing parents and deaf children may not initially share a mutually intelligible communication system (Johnson, Liddell & Erting, 1989; Gleason, 1997, p. 351). Limited social interaction with family members often leads to the isolation of deaf children (Bouvet, 1990; Dickinson & McCabe, 1991; Webster, 1986). Without adequate interfamilial interaction, deaf children may not sufficiently learn that language has a rich communicative purpose (Bouvet, 1990). Linguistic and psychosocial constraints may potentially delay oral language acquisition as well as become a source of mental and emotional strain for deaf children and their families (Lane, Hoffmeister, & Bahan, 1996).

Deaf Children and Literacy Development. Gleason (1997) states that the writing of deaf people reflects an incomplete grasp of oral language (p. 352). Constraints in language acquisition have been shown to negatively impact deaf children's ability to acquire decoding skills because they lack an underlying linguistic knowledge of English phonology,

morphology, and syntax (Kelly, 1995). A limited vocabulary can also contribute to deaf children's difficulties in lexical processing (Gleason, 1997; Kelly, 1995). Lane, Hoffmeister, & Bahan (1996) found that reduced social interaction inhibited deaf children from amassing the background knowledge necessary for reading (1996). They further state that language is a crucial element for acquiring background knowledge, thus allowing children to participate in discussions with family members, chat at the dinner table, and interact with friends and neighbors (p. 281). The reduced social interaction with family members experienced by deaf children explains, in part, why deaf children commonly lack substantial world knowledge that is essential for comprehending texts and being competent readers (p. 284). The ability to write is similarly impacted by a lack of world knowledge, as Livingston (1986) explains: "Writing and learning to write grow out of the desire to enhance and clarify our ideas and to share our knowledge with others. Without something to say, there is nothing to write" (p. 21).

To gain firsthand information on the nature of literacy acquisition by deaf individuals, case studies were carried out with two prelingually deaf adults who are postliterate. Literacy research in the field of deaf education has traditionally focused on assessing pedagogical techniques and quantifiable performance of deaf students in reading or writing tasks. Qualitative information is rarely elicited from deaf individuals themselves. Ethnographic interviewing techniques were employed to focus more seriously and personally on the deaf reader and writer. The major research questions of this study included (1) what do deaf individuals experience in learning to read and write, and (2) how may these experiences influence their actual literacy development and view of literacy as adults?

Method

Case Study Design. A case study approach was used in order to obtain qualitative data on the participants' literacy learning experiences, focusing on early childhood through adulthood. An interviewer conducted a series of semi-structured interviews designed to elicit data concerning the participants' perceptions, feelings, reactions and understanding of the process of acquiring literacy. The three primary areas of inquiry were the participants' (1) experiences in learning to read and write, (2) personal assessment of their overall literacy development, and (3) current views of literacy. A portion of the information gathered from the interviews was retrospective in nature in that the participants were asked to relate information from their childhood and teenage years. However, as in diary studies, important insights can be gleaned from the participants' reports of these past events as they provide essential insights into the development of literacy skills over time and the factors that appear to be highly influential in that development.

Participants. Two deaf adults, one male and one female, were recruited from a local Deaf community to participate in this study. The participants were carefully selected according to the criteria summarized in Table 1.

Participants met the criterion relating to literary status simply by stating that they considered themselves to be literate and by reporting on literacy-centered activities in which they currently were successfully engaged. The participants' actual literacy levels were not systematically tested because the purpose of this study was to focus more personally on deaf readers and writers themselves instead of their performance on literacy tasks. Information on the participants' dB levels was taken from medical records of hearing tests conducted by certified audiologists prior to and independently of the study.

Table 1. Case Study Participant Selection Criteria

<i>Current age</i>	21+ years old (adult)
<i>Degree of hearing impairment</i>	above 60 dB (severe to profound)
<i>Age of onset of deafness</i>	< two years (prelingual)
<i>Educational experience</i>	K-12 educational training (formal)
<i>Literacy status</i>	self-reported (literate)

Participant profiles. The participants were given pseudo-names in order to protect their identity. Table 2 presents each participant's information relative to the selection criteria. George is an adult male, age 48, who is profoundly deaf. He became deaf at two weeks of age due to complications during an exchange transfusion. He was being treated for severe jaundice that resulted from ABO erythroblastosis or blood type incompatibility between him and his mother. George began oral/aural speech training at age three. He was first exposed to ASL at age 13 when he transferred to a residential school for the deaf. He also attended the National Technical Institute for the Deaf (NTID) in Rochester, New York and received an associate's degree in architecture. He currently works as a computer technician and communicates in English with his normal-hearing employer and co-workers, although ASL is his preferred language of communication.

Melissa is an adult female, age 42, who is severely deaf. She and her twin sister Marie were born with normal-hearing abilities, but both became deaf at 16 months. Their hearing loss was attributed to the ototoxic effects of streptomycin, an antibiotic that the twins were given for an ear infection and is now known to cause sensorineural hearing loss in infants. Melissa and her sister attended a school for the deaf for one year as four-year-olds and were otherwise mainstreamed in private and public schools through high school. From kindergarten through fifth grade, Melissa and her sister received some extra-curricular speech and language training in a university-sponsored pullout program. Melissa attended a community and state college where, at age 19, she first came into contact with ASL. Her oral/aural skills are highly developed and she communicates with relative ease in English. However, she uses ASL as her primary language at home and in the local Deaf community.

Table 2. Case Study Participant Information.

<i>Participant name</i>	George	Melissa
<i>Birth date</i>	04/19/53	12/07/59
<i>Hearing acuity (unaided)*</i>	98 dB (left); 100 dB (right)	83 dB (left); 80 dB (right)
<i>Degree of hearing impairment</i>	profound	severe
<i>Age of onset of deafness</i>	2 weeks	16 months
<i>Educational experience</i>	pre K-college	pre K-college
<i>Literacy status</i>	literate	literate

Note. The range for normal-hearing acuity is 0-26 dB.

Procedures. The interviewer conducted two semi-structured interviews in two separate sessions within a three-week period with each participant. The interviews took place in the participants' homes. The interviewer and George communicated exclusively through an ASL interpreter. No ASL interpretation was necessary for the interviews with Melissa because her oral/aural skills were sufficient for her to communicate clearly and comprehensibly with the interviewer. The interviewer audiotaped the vocal communication in each interview using a compact audio recorder and detailed notes were taken on the participants' responses. The interviewer began each session with an explanation of the general focus of the interview. Target questions were asked to guide the sessions and elicit data relevant to the research questions. Specific questions asked during the interviews are included in appendix A. The interviewer paid careful attention not to make evaluative comments regarding the participants' responses while aiming to allow the interview to proceed in a natural, comfortable manner.

The first interview lasted approximately 30 minutes and elicited participants' background information, including the nature of the participants' deafness, home and family life during their growing up years, current views of literacy and involvement in literacy-centered activities. The second interview lasted approximately 90 minutes and elicited data on formal educational experiences from preschool to college.

Data Analysis. The audiotaped interviews were transcribed and formatted in word processing documents using a desktop computer for ease of access and analysis. Each individual's comments were analyzed for thematic content and were organized into categories with similar content using Holsti's (1969) method for content analysis. Strong categories emerged regarding the participants' home and school learning environments. We compared and contrasted specific aspects of the participants' environments that qualified as relevant to literacy acquisition, including (1) access to L1 and/or L2, (2) literacy exposure, (3) familial and teacher/peer communication and (4) parental involvement in school. We assessed these literacy-relevant environmental factors on an intensity scale with three primary degrees: limited, moderate and intense. These degrees

characterize the frequency and extent to which a particular factor was reported as present in the participants' environments. Table 3 illustrates how the three degrees relate to each environmental factor.

Results

Given the extensive amount of data collected from these case studies, the participants' responses will be presented individually and according to each of the literacy-relevant environmental contexts, the first being the home learning environment and second, the school learning environment. Data will then be presented regarding George and Melissa's respective views of literacy and current involvement in literacy-centered activities. Actual excerpts from the interviews are incorporated to further illustrate the data reported on each participant. Table 4 presents the assessment of home environmental factors according to the intensity scale. Table 5 presents the assessment of school environmental factors.

Home learning environment (George). With regards to L1 access, George was exposed to English from infancy through age 13. However, because of his early and profound hearing loss, he had extremely limited access to his L1. George reported that despite beginning oral/aural training at age three and wearing hearing aids, he had enormous difficulty understanding oral language during his childhood years. He related that communication "was out" at home, although he was close with his sister. His communication with his family and peers consisted of pointing, gesturing and saying individual words. He said:

"My mother and father were sometimes frustrated. They forced me to wear a hearing aid. I hated it. Wearing a hearing aid, I didn't want people to look at me because you could see the wires coming down."

He also reported that he frequently had difficulty understanding his mother. Because of these constraints, George said that he resorted to being a quiet child and did not attempt to say much.

With regards to literacy exposure and parental involvement in school, George's parents reportedly did not read books with him or encourage him to read on his own, although they and primarily his sister helped him with his homework. George said that his parents felt inadequate in personally teaching him how to read and write and left this responsibility to his school instructors. Additionally, George said that his parents were concerned about his education, stating that they enrolled him in an oral program because they felt that oral language skills would improve his opportunities in the future. In fact, George's family moved in order to be closer to the university-sponsored oral training school that he attended. They also participated in parent-teacher conferences at the oral school. When they finally realized that George was not progressing in the oral program, they responded quickly by transferring him to a residential school for the deaf.

Table 3. Intensity Scale and Environmental Factors

Factors	Limited	Moderate	Intense
Access to L1/L2	<ul style="list-style-type: none"> severely restricted sensory ability to receive linguistic input 	<ul style="list-style-type: none"> sensory ability to receive some linguistic input using residual hearing, lip-reading, hearing aid and/or gestures (ASL and non-ASL) 	<ul style="list-style-type: none"> ability to receive linguistic input effortlessly
Literacy exposure	<ul style="list-style-type: none"> rare contact rare or unconscious modeling and emphasis by adults books and other written items may or may not be present infrequent adult-guided involvement in literacy activities 	<ul style="list-style-type: none"> occasional contact occasional modeling and emphasis by adults books and other written items present some adult-guided involvement in literacy activities 	<ul style="list-style-type: none"> frequent contact frequent modeling and specific emphasis by adults books and other written items abundantly present active participation in adult- and self-guided literacy activities
Familial and teacher/peer communication	<ul style="list-style-type: none"> severely restricted, infrequent communication 	<ul style="list-style-type: none"> some communication using residual hearing, lip-reading, hearing aid, and/or gestures (ASL and non-ASL) 	<ul style="list-style-type: none"> mutually intelligible, frequent communication
Parental involvement	<ul style="list-style-type: none"> infrequent interaction and coordination with instructors and/or administrators little or no assistance with homework 	<ul style="list-style-type: none"> occasional interaction and coordination with instructors and/or administrators some assistance with homework 	<ul style="list-style-type: none"> frequent interaction and coordination with instructors and/or administrators highly engaged assistance with homework

Home learning environment (Melissa). Melissa’s access to her L1, English, was restricted by her severe and prelingual hearing loss. However, she managed to gain relative proficiency in spoken English over time through intensive oral/aural training and the use of hearing aids. Her father, now a speech pathologist, often played games with Melissa and Marie to help them learn speech. Melissa reported that she greatly enjoyed these games. She stated that she and her twin Marie were not isolated from the

rest of the family but were fully integrated in family activities. She explained:

“When I was little, I didn’t really notice I was different. At home, it seemed like normal family life. I didn’t notice until I was older. But during that time, I just played like a normal little kid and played in my family. Sometimes I wouldn’t understand [and] they would look at me and talk and I would lip-read.”

Melissa received abundant literacy exposure at home prior to and during her formal education. She related that her mother used several techniques to teach her and Marie how to read, such as putting labels on objects throughout the house, using flash cards with pictures for vocabulary building and coaching Melissa and her sister in forming sentences orally.

M: “I remember my mom had words on every furniture [and] wall. Like she had words up – *light, chair*... She’d have labels almost [all over] the whole house so we would know what it is, you know, *chair, TV*. So that helped. I could see everything had those words, what they mean. And for breakfast, lunch and dinner, she would hold a card and write out the sentence, like, *we are eating breakfast now*, then, *we are eating lunch and dinner*. We practiced. I think maybe that’s part of what helped us with the sentence, too. We’d take turns reading... then sometimes she made us cards to bless the food. And during the daytime, she had other cards that were colored red, orange, black, cat, dog. She had all those. She’d cut up pictures from magazines and glue them on cardboard. She’d work with us.”

Melissa stated that her mother helped her come to an understanding of what constituted reading and writing by establishing a literacy learning environment at home in which Melissa thrived. Additionally, Melissa speaks of her father’s concern and her older sister Elaine’s influence on her attitudes towards literacy:

“My father tried to encourage reading. But no, we loved comic[s]. But my father said, “OK. Keep buying those” because he thought it would help to read the comic books, but we would just look at the pictures. He’d [ask], “OK. What does it say?” and I’d say, “I don’t know. I just look at the pictures.” [He’d say] “But you’re supposed to read!” Anyway, so my sister took us to the library. We got Hardy Boys and romance books, mysteries. That’s where me and [Marie] really... “Oh! Wait a minute—I understand this!” I really started enjoying it then. I [started] reading more and more.”

With regards to parental involvement in school, Melissa reported that during her elementary school years, her mother frequently observed classroom instruction during the day and in the evening practiced what was

English Language Literacy Development in Deaf

taught with Melissa and Marie. At one point, her mother photographed all her classmates and labeled each picture with the appropriate child’s name so that the twins could memorize who was in their class. Melissa also stated that her parents talked with the teachers at each of the various schools she attended and gave them suggestions on how to best interact and communicate with her. Melissa indicated that her parents were a constant source of support during her junior high and high school education, assisting her with assignments involving extensive writing, such as term papers and reports and correcting her English on other written homework assignments.

Table 4. Assessment of Home Environmental Factors on Intensity Scale

Home Environmental Factors		
<i>Participant name</i>	George	Melissa
<i>Access to LI</i>	limited	moderate
<i>Familial communication</i>	limited	intense
<i>Literacy exposure</i>	limited	intense
<i>Parental involvement</i>	moderate	intense

School learning environment (George). From age three until age thirteen, English was the sole language of instruction in George’s school environment. George explains that he understood very little and relied on his sister for help with his homework.

“My sister helped me. She would give me the answers. That’s how my sister got frustrated and she told my mother and father. They talked to the teacher and said, “[George] is having some trouble.” And she said, “But [George] is so smart!” And you know where [they] have a classroom with a big mirror? It’s a big room, but [the students] can’t see out. My mother noticed that I wasn’t doing much and she asked the teacher and the teacher said, “Oh, [George] knows.” And then that night, at home, she asked me, “What did you learn?” And I said, “I don’t know.” And she realized it. So I was transferred to the [residential school]. That’s where I learned to sign.”

At the residential school, manual communication, ranging from ASL to Signed English (SE), was the means of instruction. George reported that this was his first exposure to Sign. At first, he had difficulty adjusting to a new environment and being away from home. He also reported being teased by other deaf students because he came from an oral background. However, he recounted that he eventually made some friends, acquired Sign quickly and excelled in his learning, although he said that he still received poor grades in English and social studies classes. George indicated that he felt intimidated by normal-hearing teachers who often responded negatively to incorrect answers and did not explain certain elements of grammar in a manner that he could comprehend. George stated that hearing

teachers often assumed that he knew how a certain word or phrase "went;" but as a profoundly deaf student, he said that he did not even have an inkling of how anything sounded. Although most of the hearing teachers signed fluently, he felt that their knowledge of deaf culture was meager and their understanding of the language-learning situation of the deaf was likewise inadequate. In contrast, George had a positive interaction with the few deaf instructors at the institute. George reported benefiting immensely from these instructors who seemed to understand his needs. He described one teacher in particular:

"[There was] a teacher. He helped the deaf. He taught me how to think English, how to become better in English... He taught me English composition...and I caught it, what he was saying [about] how to use the word and how to make it English. And he gave me an example and I saw that and I said, "Oh, I see! So that's how you use that!"...I wish had him when I was younger. Now I was almost graduated and if I had him, maybe I would have learned faster."

George reported that no emphasis was placed on literacy instruction in the oral/aural program until he was approximately seven years old because the program's focus was primarily speech-training and development of lip-reading skills. George described the literacy activities he was involved in during the oral/aural program in the following excerpt:

"[We learned] vocabulary, spelled the words, practiced, [but] do I know what it means? No. We go to the library, [but] do I understand how to read? I don't fully understand... [And] you know the books when you have homework, [but] do I know the answers to the work? No...I was blank. I was out...I was lost."

George reported that literacy instruction at the residential school included the following: learning to recognize multiple meanings for a single word, memorizing verb conjugations, practicing mechanics and grammar from a grammar text, diagramming sentences, and English composition. He also wrote weekly letters to his parents and expressed that he did not grasp the principles of writing. His teacher corrected his letters and he would copy each corrected letter before sending it home.

School learning environment (Melissa). English was the only language of instruction throughout Melissa's elementary and secondary education. As mentioned previously, Melissa managed to gain proficiency in English and function in school despite being severely deaf. During her enrollment in a private elementary school, she and her sister were the only deaf students in their class, but they managed to communicate well with normal-hearing teachers and peers. She stated that the teachers were sensitive to her needs, situating her at the front of the class so that she could more readily lip-read during instruction. The teachers consistently checked to make sure Melissa understood explanations and instructions given. With few exceptions, the students were equally helpful in encouraging her and making sure that she understood what was happening

English Language Literacy Development in Deaf

in the classroom as well as in their personal communication with her. With some peers, Melissa and her sister even created basic home signs to communicate.

Melissa's relationship with teachers and classmates changed dramatically in second grade when she was taken out of class for an hour each day to receive specialized instruction in speech-reading and literacy skills. She stated that his separation made her extremely unhappy. Eventually, this instruction completely replaced Melissa's regular classroom instruction through third grade. She was fully mainstreamed in fourth grade, then again fully involved in the specialized instruction in fifth grade. Melissa indicated her preference for learning in the regular classroom with her other classmates. Melissa reported that although she did gain somewhat from the specialized instruction, the teachers in the pullout program did not create a positive learning atmosphere. Discipline in the program was very strict and Melissa's privileges such as going to recess and going swimming were granted according to her performance in the program. Instead of developing a desire to improve and achieve, she said that she found herself working at a demanding pace so that she could be free from the classroom and play with her friends. She reported developing an intense hatred for the special program, the room, the teachers and the "black book" which contained all the worksheets and grammar exercises she was required to complete.

In middle and high school, Melissa stated that most of her teachers were generally willing to help and work with her. She frequently took the initiative to approach teachers after class if she had questions about instruction or homework. She reported receiving less peer support during this time, but attributed this to herself being shy. In college, she gained exposure to ASL and Pidgin Signed English (PSE). She transferred to a state college that offered signed interpretation and thrived on being able to communicate so effortlessly. In reference to signing, she said:

"It was a big difference. More friends, more social life with people. You understand what's going on. You're not afraid [to say] 'Hey! What did you say?' Signing, it really helped."

In Melissa's first two years of school, she reported that literacy instruction was minimal and focused on learning the alphabet, forming letters and recognizing small words. She also began reading simple books. The specialized pullout instruction that Melissa began receiving in second grade focused on oral/aural skills and to a lesser degree on literacy skills. This instruction included independently completing reading comprehension worksheets, reviewing chapters in a grammar text and practicing oral reading. The teachers encouraged her to use the dictionary often, but she reported that she had difficulty utilizing it. She explained:

"You know the words that have the symbols on [them]? I never understood those. I missed it in class. I never understood. So the teacher kept saying, 'Well, look at that

symbol! It's supposed to tell you how to pronounce it.'
 And I thought, 'How? I don't hear it.'"

Melissa stated that she missed the reading and writing instruction provided in her regular classroom and claimed that she was consequently behind her classmates in these skills. When asked about how the pullout sessions influenced her understanding of literacy, she said:

M: "I remember reading but not understanding. My mind was still thinking, 'I've got to pronounce it right.'"

I: "And reading without voicing it, silently?"

M: "I did try once. I remember reading it, but it was still hard for me to understand."

Melissa was mainstreamed in three different public schools from sixth to twelfth grade. English instruction was difficult because Melissa had not previously learned how to write complex sentences, paragraphs or essays. Melissa stated that she felt comfortable reading most textbooks although she had difficulty understanding her social studies text. At age 19, she enrolled in an English as a Second Language course at a community college. Through this class, she reported finally understanding the past, present and future verb tenses and many other aspects of English grammar and syntax that she had not been able to grasp earlier in regular English instruction.

Table 5. Assessment of School Environmental Factors on Intensity Scale

School Environmental Factors		
<i>Participant name</i>	George	Melissa
<i>Access to L1</i>	pre K-12: limited	pre K-12: limited-moderate
<i>Access to L2</i>	8-12: moderate-intense	n/a
<i>Teacher/peer communication</i>	pre K-7: limited 8-12: moderate-intense	pre K-5: limited-moderate 6-12: limited-moderate
<i>Literacy exposure</i>	pre K-7: limited 8-12: moderate	pre K-5: moderate 6-12: moderate-intense

Current View and Assessment of Literacy Development (George). During his entire educational career, George stated that he was never able to come to a complete understanding of English reading and writing. When asked about his current feelings about literacy, he responded:

English Language Literacy Development in Deaf

- G: "I don't like it."
- I: "Do you have to read a lot, for your work or whatever?"
- G: "Not really. I haven't been in the habit of reading. If my wife is reading and I read it, then I look at it and say 'Ugh!' (groans). I hate reading. It's because I was in the habit of not being able to read, and still not. But maybe short stories or who won the game and stuff like that. I like to read those [things]... Sometimes I read at work and I misunderstand."

George also expressed that he avoids writing messages or notes consisting of anything more than a few words. In speaking of his work situation and thoughts about improving his written English, he said:

"At work, I still have to type. My boss said [to me], 'You have weak English.' My boss noticed. I sent off an e-mail and people looked at it and [asked], 'What do you mean by that?' So I wondered, should I go back to school and take a class, English as a Second Language to help improve, or what? I haven't decided yet... I thought about it, but I think about supporting the house and the money. Going back to be a student—it's a lot to give up."

George said that practical, everyday reading is generally not a challenge although he sometimes has difficulty understanding idioms in advertisements. In reflecting back on his childhood and teenage years, George said that while he spent a considerable amount of time in school, there were no deliberate activities to reinforce his education at home. George stated that as a child, he did not understand that reading was an alternate means of communicating meaning because he did not have a concept of the purpose of communication beyond expressing immediate needs. He now attributes his inability to fully acquire English to the fact that there was no established, regular communication at home.

Personal assessment and current views of literacy development (Melissa). Melissa stated the following when asked about her current level of literacy:

"Yeah. I know that I'm not way above it, but I'm comfortable with it – reading and writing. Even though I still have little problems with writing, like, if I forget the -s's or the -ed's. But I'm comfortable and I'm not embarrassed if my English is wrong."

She said that although she does not read at college level, she enjoys reading books, novels and magazines and writes letters occasionally. She understands that there is purpose and meaning to reading and writing and

encourages her children in the development of these skills. In fact, she stated that she continues to learn from and with her children as they learn in school. In reflecting back on her education and overall literacy development, Melissa stated that although she obtained excellent grades, she still feels that she was lacking in literacy skills, even after having graduated from high school. She attributed this to the way English was presented to her. In her college ESL class, she reported that she benefited from learning grammar rules and seeing how English is structured.

Discussion

George and Melissa's responses demonstrate that their learning environments both at home and school had a significant impact on their experiences in acquiring literacy. These experiences in turn had an impact on the participants' assessment of their overall development of reading and writing skills and current attitudes towards literacy. Access to an L1 or L2, familial and teacher/peer communication, literacy exposure and parental involvement in school are particular aspects of both the home and school learning environments that play a crucial role in shaping literacy-learning experiences. One reason why these factors are especially significant relates to their potential influence on a deaf person's motivation and ability to engage in a literacy-centered activity. Motivation and ability have an integral effect on each other and on whether a particular event or activity is actualized or not. A deaf student may have the motivation to read, but if the ability to do so is not present, reading will not likely occur. Similarly, if a deaf student has the ability to read yet no motivation, again, reading will not likely occur. Additionally, successive failed attempts at a literacy-centered activity typically inhibit further attempts and foster negative attitudes, whereas successful attempts generally yield further literacy involvement and positive attitudes about the activity. We discuss the results of these case studies with reference to each identified environmental factor and its potential influence on the participants' motivation and ability to engage in activities relevant to literacy development.

Access to L1/L2. Access to the language of one's environment is a necessary condition for healthy language acquisition and provides a foundation for literacy acquisition. First language acquisition is intrinsically motivated and equips children with extensive knowledge about a particular language, and perhaps, more importantly, about language in general. As most infants, George and Melissa were born with intrinsic motivation to acquire language, yet their ability to acquire and utilize oral language was severely hampered by their hearing loss. Despite these access constraints, Melissa gained indirect access to oral language through her mother's substantial efforts to surround her by print, complementing the auditory and visual linguistic information she could perceive. Consequently, Melissa gained exceptional oral/aural skills that enabled her to comprehend mainstream instruction during her formal educational years. Melissa currently feels confident about her oral language abilities, but since being exposed to sign language at age 19, prefers communicating in ASL.

because of the natural and comparatively effortless communication it allows.

Having a profound and much earlier hearing loss than Melissa, George was more restricted in developing oral language skills at home and in his initial school environment. Oral/aural training and the use of hearing aids reportedly increased his access to spoken English only slightly. It was not until George was 13 that he finally experienced unrestricted access to language. The free-signing policy at the residential school offered George access to manual languages, but more symbolically, to meaningful, comprehensible and unlabeled communication with teachers and peers. This opened up an entire world of possibilities that George had not previously known or experienced. He gradually began to fill in the enormous gaps in his understanding of spoken and written English, yet, despite these advances, he felt that it was too late. "My mind was not awake," he said. "I was slow thinking." Encumbered by years of negative experiences and frustrations, George progressed slowly in his development of English language skills. In contrast, George acquired sign language relatively quickly and currently prefers ASL as his primary means of communication because it is accessible and enjoyable to him.

Familial and teacher/peer communication. Communication is closely linked with language access and development in its significance for literacy development. Communication makes language more than simply an organized system of combinatory linguistic units—it renders language meaningful, purposeful and useful. It is a key to social and cultural knowledge. Melissa's home environment presented language and communication holistically. Melissa was fortunate to grow up in this richly communicative setting that fostered language and literacy skills as well as strong relationships with her parents and siblings. Her home experiences and skills provided a foundation for positive interaction with teachers and peers in regular classroom instruction in most of her formal educational settings. This in part explains her frustration regarding the specialized pullout instruction that reportedly cut her off from her peers and did not allow for positive interaction between her and the instructors.

George's home and initial school environment did not provide extensive communicative opportunities for him. He gained an understanding that communication could be a tool to convey basic needs, but otherwise communication was not meaningful to him but burdensome and ironically isolating. He first learned of the richer purpose of communication through the use of sign language at the residential school. He used communication to gain interpersonal skills and build positive relationships with peers and instructors. This new understanding of the purpose of language gave George confidence, helping him to grasp the purpose of written language and make some progress in his literacy development.

Literacy exposure. Literacy acquisition, like first language acquisition, requires extensive, consistent exposure in order to take place. However, unlike first language skills, literacy skills must be actively and explicitly taught. Teachers, parents, older siblings and adult caregivers all

qualify as literacy educators in a child's world. Surrounding children by meaningful print medium, reading with them, modeling for them and encouraging them to engage in self-guided literacy activities helps them to more confidently approach the complex task of learning to read and write. Continued emphasis in both home and school settings enables children and teenagers to gain an awareness of the power of literacy and all the opportunities it affords for them. Melissa's home literacy exposure was intense, not only because of her mother's impressive efforts, but also because of the involvement and encouragement Melissa received from her father and older siblings. This familial effort continued through Melissa's high school years and helped Melissa progress from viewing literacy exclusively as a link to spoken language to grasping that it is a creative means of communication that can be enjoyable and entertaining. During her early years in the specialized pullout program, reading and writing were presented to Melissa as rote, uncontextualized activities. As a result, she dreaded literacy instruction and was inhibited from viewing literacy as meaningful. In middle and high school, however, literacy was an integral part of every course she took part in. Melissa's overall positive experiences have given her confidence to continue engaging in and enjoying reading and writing in her daily routine. The instructional approaches to literacy to which he was exposed at the oralist school were inadequate and inaccessible to him.

George's home literacy exposure was limited. Everyday reading and writing took place all around him, but he received little encouragement to participate in similar activities himself. He was struggling to grasp spoken language, leaving written language as a secondary concern. Where the written form of language could have served as a liaison to spoken language, it realized itself more as a reoccurring puzzle, reminding him of what he did not know and could not understand. George's initial school learning environment was no more conducive to acquiring literacy skills. The instructional approaches to literacy at the oralist school were equally inadequate and inaccessible to him. Written language was presented to him with essentially one purpose: to be pronounced. This minute aspect of literacy shaped his view of what reading and writing were at that time—something very uncomfortable and undesirable. He fortunately had the opportunity to gain a greater view of what literacy is through the more accessible instructional techniques employed at the residential school. Suddenly, oral language was no longer the focus and written language began to take on meaning and purpose of its own. While these experiences enabled George to make significant advances in his reading and writing abilities, George's cumulative experiences with literacy had such a damaging effect that he currently avoids any extensive reading and writing in his daily routine and has negative attitudes about literacy.

Parental involvement in school. Parental involvement in school is an especially crucial factor in literacy development because it provides the essential interface between the home and school learning environments. Parents can serve as instructors' allies and vice versa in joint attempts to promote learning and especially literacy. As parents inform themselves

English Language Literacy Development in Deaf

about their child’s progress and at the same time inform instructors about their child’s particular needs, it is more likely that the child’s overall needs will be met and compensated for as necessary. Melissa’s comments show the overwhelming dedication of her mother to her children’s literacy development. Her mother’s efforts to be involved at school and to use similar teaching methods at home reinforced the learning taking place at school, and possibly counteracted the meager learning taking place during the pullout sessions. The conscientious efforts of Melissa’s parents to inform her teachers about her particular needs gave the teachers the necessary information to provide Melissa with maximally beneficial instruction and to sensitize themselves to her language and literacy learning situation.

George benefited from having parents concerned about his future and performance at school. However, his parents did not have sufficient confidence to provide a literacy-learning environment at home that would complement what he was attempting to learn at school. They signified involvement through helping George with his homework and showed initiative when they finally recognized that he was not progressing in the oral program and chose to transfer him to a school better suited to his needs. However, it is unfortunate that there was not a stronger interface between George’s parents and teachers at the oral school, primarily because they may have earlier ascertained that George’s needs were not being met in that particular educational setting.

Although George and Melissa come from different familial and educational backgrounds, their collective responses underline the fact that positive experiences in learning to read and write increase motivation and ability to further engage in literacy-centered activities whereas negative experiences strongly inhibit motivation and hamper ability to involve oneself in such activities. In Table 6, we provide a summary of environmental factors that enhanced literacy-learning based on both participants’ reports.

Table 6. Enhancing Environmental Factors.

Enhancing Factor	Home Environment	School Environment
<i>Access to L1/L2</i>	<ul style="list-style-type: none"> Parents established an environment where language was accessible and linguistically sufficient. 	<ul style="list-style-type: none"> School policy allowed for modes of communication that were accessible and linguistically sufficient.
<i>Familial and teacher/peer communication</i>	<ul style="list-style-type: none"> Parents established a communicative environment where frequent interaction occurred between parents and children and among siblings. The communication that took place was meaningful and purposeful. 	<ul style="list-style-type: none"> Teachers understood the unique challenges faced by deaf students and adjusted communication to accommodate needs. Teachers checked students’ comprehension frequently and offered suitable, understandable explanations.

English Language Literacy Development in Deaf

		<ul style="list-style-type: none"> • Teachers engaged students in creative dialogue. • Peers were supportive and communicated naturally and sensitively with students.
<i>Literacy exposure</i>	<ul style="list-style-type: none"> • Parents and siblings presented literacy creatively and holistically. • Parents and siblings encouraged and provided ample opportunities for active participation in literacy-centered activities. • Parents surrounded children with literacy items, such as labels, signs and books. • Parents and siblings openly modeled reading and writing in daily routine. 	<ul style="list-style-type: none"> • A general curriculum was offered where all skill areas (Speaking/ Listening/ Reading/ Writing/ Grammar) were taught within a contextualized program. • Teachers presented reading and writing in authentic contexts. • Teachers established a highly interactive learning environment. • Literacy activities were constructive and enjoyable.
<i>Parental involvement in school</i>	<ul style="list-style-type: none"> • Parents creatively devised literacy teaching techniques to prepare children for school learning. • Parents proactively practiced techniques and content presented at school with children at home. • Parents consistently informed themselves about their child's progress and compensated as necessary. • Parents communicated with teachers regarding their child's needs and learning behaviors. 	

Suggestions and Conclusion

This study examined the literacy-learning experiences of two prelingually deaf adults who are postliterate. The participants reported data that strongly demonstrate the impact of experience on attitudes and personal assessments of literacy achievement. The home and school environments are the primary contexts for learning experiences during formal educational years. Particular environmental factors, including L1/L2 access, familial and teacher/peer communication, literacy exposure, and parental involvement in school significantly influence literacy-learning experiences. Based on the results of this study, we discuss suggestions for caregivers and educators of deaf students.

Emergent literacy context. The results of this study place considerable responsibility on the caregivers and families of deaf children. The discussion on primary language acquisition and its role in literacy development underscores the importance of providing deaf children with maximum opportunities for exposure to language that is accessible to them. This decision should largely depend on the nature and degree of a child's deafness. A severe to profound hearing loss with sensorineural damage to the inner ear, for example, merits serious consideration of providing a deaf child with exposure to a natural sign language, such as ASL. Ready access to language will enable deaf children to have positive and successful

English Language Literacy Development in Deaf

experiences with language and to naturally develop competence in an L1. Establishing interactive and unstrained learning environments will help deaf children to have a positive view of language and an understanding of its purpose. Including deaf children in family discussions and allowing them to freely exchange and create ideas is an intrinsically motivating activity that helps children gain world knowledge (Brown, 1994; Lane, Hoffmeister, & Bahan, 1996).

Researchers have consistently found that parents reading to their children, or shared book-reading, has a very positive effect on children's literacy development (Gleason, 1997). Shared book-reading may also establish a feeling of closeness between parents and their children which allows children to associate feelings of enjoyment and well-being with reading. Reading to children and surrounding them with print will lay the groundwork for introducing literacy in a meaningful and language-rich environment. This will also enable children to have successful and pleasurable experiences with reading and writing as opposed to only viewing literacy experiences as a means to reinforce oral skills.

Regarding the psychosocial environment of deaf children at home, results from this study suggest that some parents with deaf children intuitively create opportunities for language development, while other parents, frustrated with the inability to communicate with their child shift the burden of teaching and learning entirely to school personnel. Parents could benefit from comprehensive mentoring programs that offer counseling and training in raising deaf children, allowing parents and families to be positively involved in their child or sibling's formative growth. Programs such as IMPACT (Independently Merging Parents Associations of California) and other non-profit mentoring groups are an invaluable resource to parents who need counsel and understanding concerning critical developmental issues that effect deaf children, options for education, and ways to balance care for their deaf child with the various other demands of family life. This research identifies that deaf children have unique and vital needs and that it is important for those involved in a deaf child's development to become familiar and sensitive to those needs.

Educational Literacy Context. Many prelingually deaf children arrive at school without a well-developed primary language (Strong, Woodward, & Burdett, 1987; Lane, Hoffmeister, & Bahan, 1996). Educators should be aware that literacy instruction presents deaf children with considerable obstacles because they generally have not yet completely acquired a substantial vocabulary nor a working understanding of the complicated syntactic and grammatical structures of spoken language (Cornett & Daisey, 1992). Traditional reading and writing instruction is not appropriate for many deaf children because it draws upon background knowledge and linguistic experience that they may not fully possess.

The findings of this research also underscore the importance of teachers conducting a needs analysis of the deaf learner in order to assess the home, school and language contexts in which that learner is striving to develop literacy skills. Being well-informed about students' needs will help teachers in developing educational curricula and specifically techniques for

teaching literacy skills. Such techniques should compensate for areas in which students are lacking and build upon students' individual strengths. Because deaf students in a single classroom typically have diverse backgrounds and needs, employing a variety of techniques and activities is advisable in order to meet a wider range of student needs. In cases where students come from disadvantaged home situations, the teacher has an even greater responsibility to attend to the students' language and literacy needs. Teachers should also evaluate carefully when rehabilitative approaches to language development are appropriate. Many deaf children have not fully developed a language to rehabilitate. In such cases, compensation should be a guiding principle.

Teachers of deaf students should approach fostering literacy in meaningful and language-rich environments. Consistently exposing students to print, engaging them in authentic literacy-related activities, encouraging them to read and write on their own, and emphasizing the importance of literacy skills are ways to tap into children's intrinsic learning power. In addition, the impact of being an example to students cannot be overlooked. Children are very aware of the behavior of those around them. Teachers should show students that reading and writing are very creative and powerful tools. This principle should be incorporated into literacy instruction. Communication and meaning are paramount.

While the suggestions given in this article are based on data from only two case studies, the experiences of these two deaf adults are similar to others shared by deaf adults in the Deaf community. In order to further substantiate the findings of this research, similar interviews should be carried out with several prelingually deaf adults who are postliterate. Additional data from such interviews would provide a more comprehensive analysis of the positive and negative influences of home and school environmental factors. Interviewing the participants' parents, siblings, and teachers, if possible, would yield additional information on the dynamics of both learning situations as well as verify the accuracy of the information given by participants. A compilation of various deaf adults' language and literacy learning experiences would be a valuable resource for parents as they make critical decisions about their child's education at home and school.

Footnotes

¹The discussion of cognitive development in this paper deals primarily with verbal cognitive skills, that is, the ability to reason and represent abstract concepts verbally. Researchers Myklebust (1953) and Braden (1994) have identified that cognitive development is not entirely dependent on language development, as is the case with many deaf people who have experienced some degree of language deprivation but score equally well on nonverbal tests of intelligence.

²It is quite possible that oral language is not an essential or mandatory precursor to literacy development. In deaf education, for example, proponents of the bilingual/bicultural approach assert that deaf students can learn to read and write in English without any background or proficiency

English Language Literacy Development in Deaf

in oral English (Paul & Jackson, 1993). In ASL/ESL programs, students gain L1 competency in signed ASL and ASL literacy and accordingly use metalinguistic and cognitive skills to acquire literacy in English (Lane, Hoffmeister, & Bahan, 1996). Although no conclusive studies on the effectiveness of ASL/ESL programs have been done to date, we believe it is possible to learn to read and write a spoken language without initial oral competence in that language. Oral language is partly seen as a prerequisite to reading and writing because many pedagogical approaches draw and build upon students' underlying linguistic competence in literacy instruction. However, many deaf children begin learning to read and write without a well developed primary language and as a result face tremendous challenges in traditional literacy instruction (Lane, Hoffmeister, & Lane, 1996). In addition, because the majority of teachers in deaf education are hearing (Sacks, 1990), teachers may unintentionally teach literacy with a verbal bias, that is, they assume that deaf students know what print says or the gist of a certain word or phrase. Thus, oral language may be a prerequisite to literacy development purely because of the way literacy is traditionally taught. Further research may identify whether it would be pedagogically effective to treat written language as a unique language as opposed to being inextricably linked to oral language (see Gleason, 1997, p. 352).

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Appendix A

Interview 1: Basic Demographics, Home Learning Environment, and Views of Literacy

1. What is your name?
2. What is your birthdate?
3. At what age did you become deaf?
4. What was the cause of your deafness?
5. What is the degree of your hearing loss (in dB)?
6. Are your parents hearing or deaf?
7. What was your first language?
8. How early did you start learning your first language? (i.e. formally or at home)
9. How did you communicate with your parents/siblings?
10. What type of relationship did you have with your parents/siblings? (i.e., positive, negative, neutral, etc.)
11. How early did you begin learning to read and write?
12. Did your parents help you learn to read and write? If yes, how?
13. Did your parents/siblings help you with your school work (specifically reading/writing exercises)?
14. Did your parents or siblings read to you as a child?
15. At what point did you understand the meaning of print?
16. At what point did you understand what reading and writing are and what their purpose is?
17. How do you view the purpose of reading and writing today?
18. How do you feel about reading and writing today? (i.e., do you enjoy/hate it or have neutral feelings about literacy?)
19. How do you feel about your reading and writing ability today? (i.e., what is your estimated literacy level? Ask about basic survival literacy skills for everyday living (e.g., reading signs, labels, newspaper, ads, etc.) vs. fluent reading/writing skills)
20. Does your current situation (i.e., job/home) require you to read/write often? How successful would you say you are at meeting the literacy demands of your workplace/home environment?

Interview 2: School Learning Environment

1. At what age did you begin your formal education?
2. What type of school/program were you enrolled in? (i.e., oral, mainstream, residential school, etc.)
3. What was the focus of the school/program you attended? (i.e., oral/aural skills, general education, etc.)
4. What was the language of instruction in the classroom?
5. How did you communicate with instructors in one-on-one situations? with classmates?

6. How did your teacher(s) teach you to read and write? (i.e., what activities/exercises did teachers have students engage in to learn and practice reading/writing).
7. Do you feel that you benefited from reading/writing instruction at the school you attended? (i.e., did you learn to read/write and come to understand the purpose of reading/writing)
8. What type of relationship did you have with your teacher(s)?
9. What type of relationship did your parents have with your teacher(s)?
10. Were you enrolled in any other schools/programs during your primary and secondary (i.e., K-12) education? (If yes, follow with questions 2-9).
11. Did you attend a college or university? If yes, did you have English instruction there? (If yes, follow with questions 3-8).

Note: If the participant attended the same school throughout her/his K-12 education (i.e., a residential school), ask her/him to describe as much as possible the different literacy experiences she/he had at different stages using questions 3-9.

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